

Highly Efficient FUV Photodetector with AlGaIn Nanowire Photocathode, Phase I

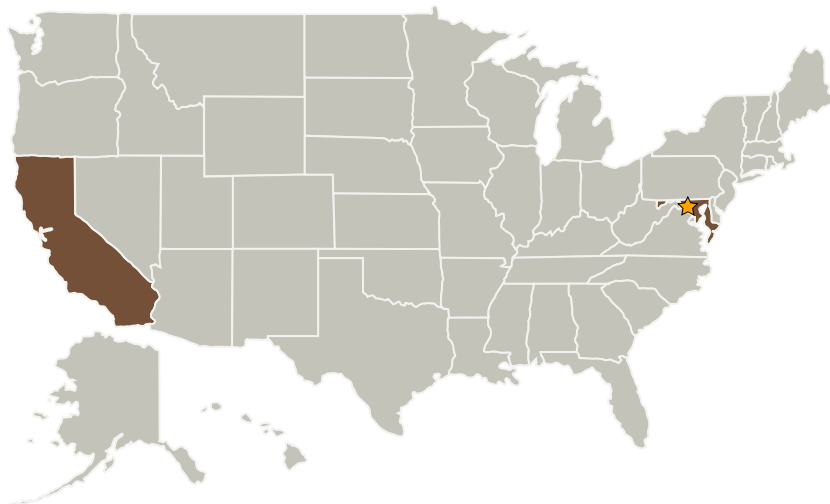
Completed Technology Project (2009 - 2009)



Project Introduction

To address the NASA GSFC need for significant improvements in wide bandgap materials and detectors for UV applications, Physical Optics Corporation (POC) proposes to develop a new Silicon Microchannel Plate solar-blind photodetector with an AlGaIn nanowire photocathode fabricated directly on the MCP entrance plane (NW-Si-MCP). This innovative photocathode and the technology of its growth on the Si microchannel plate enables us to meet NASA requirements for high quantum efficiency, low noise, radiation-hard, reliable, and potentially low cost solar-blind photodetectors. The large size and high number of microchannels offers superior spectral and spatial resolution for future NASA space instruments involved in the investigation of the origin of Universe, planet finding, and understanding Sun-Earth interactions while simultaneously improving the sensitivity of new instruments and avoiding an expensive increase of their cost due to optical system size. In Phase I, POC will demonstrate the feasibility of fabrication of AlGaIn nanowire photocathodes for NW-Si-MCP detectors by fabricating the photocathode samples and demonstrating their quantum efficiency in the spectral range from 100 nm to 200 nm (TRL level 4). In Phase II, POC plans to develop a fully functional NW-Si-MCP prototype and demonstrate its long-term operation in harsh conditions (TRL level 6).

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center
(GSFC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Physical Optics Corporation	Supporting Organization	Industry	Torrance, California

Primary U.S. Work Locations

California	Maryland
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.3 Thermal Protection Components and Systems
 - └ TX14.3.2 Thermal Protection Systems